

WHAT IS CLAIMED IS:

1. An equalizer for equalizing a detection signal obtained by detecting a transmission signal with periodically inserted known symbol patterns made up of at least one symbol, said equalizer comprising:

symbol pattern synchronizing means for reproducing symbol timing by detecting said symbol patterns based on said detection signal;

equalizing means for acquiring an equalization signal by multiplying signals extracted from said detection signal at predetermined intervals and weights;

symbol pattern generating means for generating a reference signal equal to said symbol pattern;

error calculating means for acquiring an equalization error by subtracting said equalization signal from said reference signal; and

weight updating means for updating said weights based on said detection signal and said equalization error at the timing of said symbol pattern.

2. The equalizer according to claim 1, wherein said weight updating means updates said weights using an error power minimizing algorithm.

3. A receiver for carrying out diversity receiver for a transmission signal with periodically inserted known symbol

patterns made up of at least one symbol, said receiver comprising:

a plurality of antennas for receiving said transmission signal;

a plurality of detecting means for carrying out quadrature detection on the reception signals from said corresponding antennas;

a plurality of equalizers for carrying out equalization using the outputs of said corresponding detecting means;

selecting means for selecting the outputs of said plurality of equalizers;

data decision means for deciding data based on the output of said selecting means,

wherein each of said plurality of equalizers comprises:

symbol pattern synchronizing means for reproducing symbol timing by detecting said symbol patterns based on the output signals of said detecting means;

equalizing means for acquiring an equalization signal by multiplying signals extracted from said detection signal at predetermined intervals and weights;

symbol pattern generating means for generating a reference signal equal to said symbol pattern;

error calculating means for acquiring an equalization error by subtracting said equalization signal from said reference signal; and

weight updating means for updating said weights based on said detection signal and said equalization error at the timing of said symbol pattern.

4. The receiver according to claim 3, wherein said weight updating means updates said weights using an error power minimizing algorithm.

5. A receiver for carrying out diversity receiver for a transmission signal with periodically inserted known symbol patterns made up of at least one symbol, said apparatus comprising:

a plurality of detecting means for carrying out quadrature detection on the reception signals from said corresponding antennas;

symbol pattern synchronizing means for reproducing symbol timing by detecting said symbol patterns based on said plurality of detection signals;

one or more equalizing means for acquiring equalization signals by multiplying signals extracted from the outputs of said corresponding detecting means at predetermined intervals and weights;

combining means for combining the outputs of said plurality of equalization signals;

symbol pattern generating means for generating a reference signal equal to said symbol pattern;

error calculating means for acquiring an equalization error by subtracting said equalization signal from said reference signal;

one or more weight updating means for updating weights based on said corresponding detection signals and said

corresponding equalization errors at the timing of said symbol pattern; and

data decision means for deciding data based on the output of said combining means.

6. The receiver according to claim 5, wherein said weight updating means updates said weights using an error power minimizing algorithm.

7. An equalization method for carrying out equalization processing, said method comprising:

a step of equalizing a detection signal obtained by detecting a transmission signal with periodically inserted known symbol patterns made up of at least one symbol; and

a step of detecting a symbol synchronization position by detecting said symbol patterns based on said detection signal,

wherein equalization processing is carried out based on weights updated when the synchronization position of said detection signal is detected, whereas equalization processing is carried out without weight updating when the synchronization position of said detection signal is not detected.

8. The equalization method according to claim 7, wherein said weight updating is carried out using an error power minimizing algorithm.

9. A reception method for carrying out diversity receiver for a transmission signal with periodically inserted known symbol patterns made up of at least one symbol, said method comprising:

a reception step of receiving said transmission signal by a plurality of antennas;

a detecting step of carrying out quadrature detection on received signals from said corresponding antennas using a plurality of detecting means;

a plurality of equalizing steps of carrying out equalization using the outputs of said corresponding detecting means;

a selecting step of selecting processing results obtained by said plurality of equalizing steps corresponding to said plurality of detecting means; and

a deciding step of deciding data based on said selected processing result;

wherein each of said plurality of equalizing steps comprises: a step of equalizing a detection signal obtained by detecting a transmission signal with periodically inserted known symbol patterns made up of at least one symbol; and a step of detecting a symbol synchronization position by detecting said symbol patterns based on said detection signals, wherein equalization processing is carried out based on weights updated when the synchronization position of said detection signal is detected, whereas equalization processing is carried out without weight updating when the

synchronization position of said detection signal is not detected.

10. The reception method according to claim 9, wherein said weight updating is carried out using an error power minimizing algorithm.

11. A reception method for carrying out diversity received for a transmission signal with periodically inserted known symbol patterns made up of at least one symbol, said method comprising:

a step of receiving said transmission signal by a plurality of antennas;

a step of carrying out quadrature detection on received signals from said corresponding antennas using a plurality of detecting means; and

a step of detecting a symbol synchronization position by detecting said symbol patterns based on said plurality of detection signals;

wherein equalization processing is carried out based on weights updated when the synchronization position of said detection signal is detected, whereas equalization processing is carried out without weight updating and the respective outputs of equalization processing are combined with each other when the synchronization position of said detection signal is not detected.

12. The reception method according to claim 11, wherein said weight updating is carried out using an error power minimizing algorithm.

13. A reception method for carrying out diversity receiver for a transmission signal with periodically inserted known symbol patterns made up of at least one symbol, said method comprising:

a step of receiving said transmission signal by a plurality of antennas;

a step of carrying out quadrature detection on received signals from said corresponding antennas using a plurality of detecting means;

a step of detecting a symbol synchronization position by detecting said symbol pattern based on detection signals output from said plurality of detecting means;

wherein equalization processing is carried out based on weights respectively updated when the synchronization position of said detection signal is detected, whereas equalization processing is carried out without updating of respective weights and the respective outputs of equalization processing are combined with each other when the synchronization position of said detection signal is not detected.

14. The reception method according to claim 13, wherein said weight updating is carried out using an error power minimizing algorithm.